

### Remarks

The Applicants acknowledge the rejection of Claims 1 – 14 under 35. U.S.C. §112. This rejection has previously been addressed in detail. However, the Applicants will more specifically address the detailed comments of the February 5, 2003 Official Action. That rejection specifically states that Claims 1 – 14 are indefinite “for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite physical properties of multifilament polytrimethylene terephthalate yarn (i.e. Young’s modulus, strength, elastic recovery, residual extension, shrinkage stress, boiling water shrinkage, CV value and CF value). *Ex parte Slob*, 157 USPQ 172, states the following with regard to an article claimed by defining property values:

“Claims merely setting forth physical characteristics desired in article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite and functional since they cover any conceivable combination of ingredients, either presently existing or which might be discovered in future and which would impart desired characteristics; thus expression “a liquefiable substance having a liquefaction temperature from about 40°C to about 300°C and being compatible with the ingredients in the powdered detergent composition” is too broad and indefinite since it purports to cover everything which will perform the desired functions regardless of its composition, and in effect, recites compounds by what it is desired that they do rather than what they are; expression also is too broad since it appears to read upon the materials that could not possibly be used to accomplish purposes intended.”

That is the first portion of the §112 rejection. There are subsequent comments which are further relied upon for the rejection. Those comments are as follows: “Furthermore, it is necessary that the product be described with sufficient particularity that it can be identified so that one can determine what will and will not infringe. Thus, claims 1 – 14 are indefinite for reciting only the desired physical properties of the multifilament polytrimethylene terephthalate yarn, rather than setting forth structural and/or chemical limitations of said fabrics.”

The Applicants respectfully submit that Claims 1 – 14 are fully in compliance with 35 U.S.C. §112. Nonetheless, the Applicants have amended Claim 1 so that it recites “A polyester multi-filament yarn comprising a plurality of polytrimethylene terephthalate filaments that form the yarn such that the yarn has strength from a stress-strain curve....” Thus, Claim 1 specifically relates to a polyester multifilament yarn. The yarn is formed from a plurality of polytrimethylene terephthalate filaments. The yarn that is formed from the polytrimethylene terephthalate filaments has the recited strength, Young’s modulus, elastic recovery and the like, as specifically claimed. Hence, the Applicants have provided definite structure. The structure is a yarn. Yarns are well known to those of ordinary skill in the art. The yarn is comprised of a plurality of polytrimethylene terephthalate filaments. Filaments are well known to those of ordinary skill in the art. Similarly, polytrimethylene terephthalate and its chemical structure is well known to those of ordinary skill in the art.

The Applicants have further specified that the yarn has various characteristics such as the strength, Young’s modulus, elastic recovery and the like, as specifically claimed. It is the yarn that has these physical characteristics and not the individual filaments. As a consequence, the Applicants respectfully submit that *Ex parte Slob* is not applicable. That case involved claims wherein no physical structure was present. *Slob* merely referred to a “liquefiable substance.” No structure is recited in the *Slob* claim language. That is sharply contrasted to the Applicants’ specific claim language that refers to a “polyester multifilament yarn,” on the one hand, and a “plurality of polytrimethylene terephthalate filaments,” on the other hand.

The Applicants parenthetically note that the Takahashi reference, cited against various of the solicited claims herein and discussed later, has even less structure than in the claim language than the structure in this claim. The Applicants do not bring this to the Examiner’s attention for the proposition that just because the Takahashi claim was allowable that this claim should be allowable. It is

brought to the Examiner's attention to point out that those of ordinary skill in the art are quite aware of language of the type in the Takahashi claims and of the type recited herein and, as a consequence, such language is, in fact, known in the art and is not in any way considered indefinite. The Applicants respectfully request withdrawal of the §112 rejection on this basis alone.

Nonetheless, as referred to above, the Official Action recites that it is necessary that the product be described in sufficient particularity that it can be identified so that one can determine what will or will not infringe. Referring to solicited Claim 1 herein, this is easy for one of ordinary skill in the art to do. It is simple indeed for one of ordinary skill in the art to identify whether an allegedly infringing item is a polyester multifilament yarn. The multifilament yarn portion can be determined merely by the naked eye. It is well known to those of ordinary skill in the art as to how a multifilament yarn can be determined as to whether it is polyester. It is similarly well known to those of ordinary skill in the art how to determine whether filaments that comprise the yarn are made of polytrimethylene terephthalate. This is readily determined with no degree of uncertainty.

Similarly, it is very, very easy for one of ordinary skill in the art to conduct tests as to whether the yarn (as opposed to the individual filaments) has the claimed strength, has the claimed Young's modulus, has the claimed elastic recovery and the like. The Applicants' Specification provides detailed instructions as to how those physical characteristics can be determined. The tests begin at the bottom of page 16 and extends through the top portion of Claim 19 of the Specification. Again, this is easily and readily conducted by one of ordinary skill in the art. Thus, it is a simple matter for one of ordinary skill in the art to determine whether the claimed subject matter would be infringed. The Applicants therefore respectfully request that the §112 rejection be withdrawn.

The Applicants have further amended Claim 1 to recite “a lengthwise direction of the yarn” to ensure that there is antecedent basis for “lengthwise direction.” Entry into the Official File is respectfully requested.

The Applicants acknowledge the 35 U.S.C. §112 of Claim 21 and note with appreciation the Examiner’s helpful comments concerning antecedent basis. Claim 21 has been amended to delete “textured”, which thereby provides the appropriate antecedent basis. Withdrawal of the rejection is respectfully requested.

Turning now to the merits, the yarns made in accordance with aspects of this invention can be specified by the following conditions (A) through (D):

A. Producing a polyester yarn by a direct-spinning-drawing method, wherein a polymer substantially composed of polytrimethylene terephthalate having an intrinsic viscosity ( $\eta$ ) of 0.7 or more, is melt-spinning and successively drawing;

B. Taking up at a spinning speed of 2000 m/min or higher, successively drawing at a low rate without winding up, heat-treating, and continuously heat-treating with relaxation at a relaxation rate of 6 to 20%, wherein the draw rate is such a value as to keep the breaking extension of the obtained yarn at 40% or more;

C. The drawing, heat treatment and continuous heat treatment with relaxation are performed, by using a heated roller of 105 to 180°C with a surface roughness of 1.5 to 8S and by winding the yarn around the heated roller several times. In this case, the drawing is accomplished before the heated roller, and the heat treatment is performed while the yarn is wound around the heated roller several times, the heat treatment with relaxation being performed after the yarn has left the heated roller; and

D. Subsequently and successively applying interlacing treatment to achieve a CF value of 1 to 30, and winding into a package.

Thus, it is important to produce a polyester yarn through the steps of taking up at a high speed (spinning speed of 2000 m/min or higher), drawing at a low rate (i.e., at such a low rate as to keep the breaking extension of the obtained polyester yarn at 40% or more, for example, a rate of 1.9 times or more), heat-treating, and heat-treating with relaxation at a high relaxation rate (relaxation rate 6 to 20%).

The polyester yarn that results from this production method is a polytrimethylene terephthalate filament yarn having such properties as not too low breaking extension (40% or higher), low Young's modulus (25 cN/dtex or lower) and elastic recovery capability (recovery rate of 90% or more at 10% elongation). That is, this invention produces yarns with a lower modulus.

This production method that employs the above-mentioned production conditions of high speed take-up (2000 m/min or higher) and a high relaxation rate (relaxation rate 6 to 20%), allows the production of an excellent polyester yarn (a yarn specified by the constituent features of Claim 1, especially by a constituent feature that the minimum value of differential Young's modulus at an elongation of 3 to 10% is as low as 6.6 cN/dtex or lower).

The Applicants acknowledge the 35 U.S.C. §103 rejection of Claims 1 – 9, 12 – 13 and 25 – 28 over EP '422. The Applicants note with appreciation the Examiner's helpful and detailed comments concerning application of EP '422 to those solicited claims. EP '422 does not teach or suggest or show any example that employs the production conditions of high speed take-up (2000 m/min or higher) and a high relaxation rate (relaxation rate 6 to 20%). Comparative Example 5 in "Fujimoto" employs high speed take-up with a spinning speed of 4000 m/min and a high relaxation

rate of 8%, but the result is, “Yarn breaking often occurred during the process and the filament yarn could not be wound.”

As described above, the production of yarns under the conditions of high speed take-up (2000 m/min or higher) and a high relaxation rate (relaxation rate 6 to 20%) cannot be carried out under the production equipment conditions disclosed in EP ‘422. This invention uses a heated roller (105 to 180°C) with a rough surface (surface roughness 1.5 to 8S) as the second heated roller at heat treatment, and applies interlacing treatment (CF value 1 to 30) between the relaxation heat treatment and winding up. This is sharply different from EP ‘422 and results in yarns with different physical characteristics. For example, among the constituent features of Claim 1, the constituent feature, “a minimum value of a differential Young’s modulus at 3 – 10% extension is no more than 6.6 cN/dtex,” cannot be obtained in the method of EP ‘422, and has been obtained for the first time by the Applicants. This is described in the Experimental Report of Jinichiro Kato filed January 6, 2004.

Since the Examples of EP ‘422 do not employ both taking up at a high speed (2000 m/min or higher) and relaxing at a high relaxation rate (6 to 20%), the obtained filament yarns do not satisfy the constituent feature, “a minimum value of a differential Young’s modulus at 3 – 10% extension is no more than 6.6 cN/dtex.” Furthermore, in Comparative Examples 4 and 5 of this application, the relaxation rate was as excessively low as 3% or 0% (out of the constituent feature of this invention), though the high speed take-up was employed with a spinning speed of 3000 m/min. Hence, the obtained yarn at the Comparative Examples had the differential Young’s modulus of 11.2 cN/dtex or 14.4 cN/drex (out of the constituent feature of this invention).

Moreover, in this invention, since production conditions of using a specific second heated roller and applying interlacing treatment are used for production as specified in Claim 15, a yarn with good quality, wherein the irregularity of physical properties in the longitudinal direction of yarns is

small, can be obtained. This is expressed by the property that “a CV value of the continuous shrinkage in the yarn lengthwise direction is no more than 4%.”

The Applicants also note with appreciation the Examiner’s frank acknowledgment that EP ‘422 does not explicitly teach a number of the claimed properties. However, as the portion of the Official Action on page 5 about mid-page indicates, the rejection is essentially based on the presumption that the claimed properties are inherent to EP ‘422. The Official Action also relies on *In re Fitzgerald* for the notion that the burden is upon the Applicant to prove otherwise.

The Applicants respectfully submit that *In re Fitzgerald* is outdated and that the burden is not on the Applicant to prove otherwise in this case. In fact, the reference upon which inherency is based must “necessarily” provide the so-called “inherent characteristics” for that reference to be applicable and for the burden to be shifted to the Applicant. There are numerous cases that provide this standard. The MPEP also confirms this standard.

In this case, the Applicants respectfully submit that EP ‘422 does not provide a disclosure that would lead one of ordinary skill in the art to the conclusion that the claimed characteristics would necessarily be present in the products disclosed by EP ‘422. The reasons for this are that the methodology of EP ‘422 is different from the methodology employed by the Applicants. In that regard, the Applicants note that it is not necessary for the Applicants’ claims to include method language to be so distinguished. The Applicants need to show is that their product may be produced by a method that is different than the method of production of the products of EP ‘422. This will indicate that the claimed characteristics are not necessarily present in the EP ‘422 products.

For example, as noted above, the fact that the Applicants’ multifilament yarns are produced using a heated roll of surface roughness 1.5S - 8S at 105 - 180°C. This is not the case in EP ‘422. Careful scrutiny of the entire EP ‘422 disclosure reveals that there is not one word of disclosure

regarding a surface roughness of any type, much less the claimed surface roughness at the claimed temperature.

The fact that the Applicants' multifilament yarns are not wound in the same manner as EP '422 and the fact that EP '422 fails to disclose any surface roughness, much less the claimed surface roughness and the claimed temperature, makes it clear that there is great potential for differences in physical characteristics between the yarns of EP '422 and the Applicants' yarn. Accordingly, the Applicants respectfully submit that the claimed physical characteristics of the Applicants' product are not necessarily present in the EP '422 disclosure. Those physical characteristics might be present, might likely be present or might likely not be present. However, that is all irrelevant. What is required for an inherency rejection is that the physical characteristics necessarily be present in the products of EP '422. There is nothing on this record that would lead one of ordinary skill in the art to believe that the claimed physical characteristics are necessarily present in the EP '422 products. In fact, the Applicants have raised two significant differences that would lead one of ordinary skill in the art to the conclusion that the physical characteristics would likely be different. Again, this does not rise to the required "necessarily present" standard required for an inherency rejection. The Applicants therefore respectfully submit that EP '422 is inapplicable to Claims 1 – 9, 12 – 13 and 25 – 28 under §103. Withdrawal of the rejection is respectfully requested.

The Applicants acknowledge the rejection of Claim 14 under 35 U.S.C. §103 over the hypothetical combination of JP '747 with EP '422. The Applicants respectfully submit that hypothetically combining JP '747 with EP '422 fails to cure the deficiencies set forth above with respect to Claims 1 – 9, 12 – 13 and 25 – 28. Withdrawal of the rejection of Claim 14 is accordingly respectfully requested.

The Applicants acknowledge the rejection of Claims 15 – 19, 21 – 22 and 24 under 35 U.S.C. §103 over US ‘446. The Applicants respectfully submit that US ‘446 is inapplicable to Claims 15 – 19, 21 – 22 and 24. The production method disclosed in US ‘446 is a method for producing polyethylene terephthalate yarn having a high strength (8.0 g/d or higher) and a low breaking extension (17% or lower), hence a high Young’s modulus. That is, the US ‘446 production method is intended to obtain yarn with a low breaking extension and a high modulus.

Although the production method disclosed in US ‘446 undergoes a process comprising the steps of taking up at a spinning speed of 2000 m/min or higher, drawing in succession without winding up, heat-treating, and continuously heat-treating with relaxation, it employs a condition for producing polyethylene terephthalate yarn with a low breaking extension (17% or lower). Therefore, in the examples, the total draw ratio is in a range from 2.5 to 2.8 times and polyethylene terephthalate yarns with the breaking extension of in a range from 14.1 to 16.7% are produced.

As described above, the production method described in US ‘446 is a method for producing polyethylene terephthalate yarns with a high strength, low breaking extension (17% or lower) and high modulus. However, even if the production method to obtain yarns with such a low breaking extension and a high modulus is employed, yarns with a relatively high breaking extension (40% or higher) and a low Young’s modulus cannot be obtained.

Furthermore, in the production method of US ‘446, a heated second drawing roller and a non-contact heat treatment heater installed near it are used for providing heat for the heat treatment. However, the temperature of the second drawing roller is high, being from 240 to 255°C in the Examples, and the surface roughness of the second drawing roller is not shown.

For producing yarns with a high strength, low breaking extension and high modulus, it is necessary that the yarn does not slip on the surface of the heated rollers used for drawing and heat

treatment. Hence, the drawing roller in the production method of US ‘446 is reasonably assumed to have a smooth surface for preventing the slip of the yarn on the roller.

Therefore, the heated drawing roller of US ‘446 has a smooth surface and a temperature of 240 to 255°C. That temperature and surface state condition are different from those of the heated drawing roller of this invention (rough surface defined by surface roughness of 1.5 – 8S, and surface temperature of 105 - 180°C). (The heated drawing roller conditions of the present invention are not described in EP ‘422 either.)

In conclusion, the Applicants’ independent Claim 15 specifically recites that a heated roll of surface roughness 1.5S – 8S at 105 - 180°C is employed in the method of producing the claimed multifilament yarn. The Applicants have reviewed the entire US ‘446 disclosure and do not find any reference to the use of a roll having a surface roughness of any type, much less the claimed surface roughness of 1.5S – 8S and/or the claimed 105 - 180°C heating temperature in conjunction with such a surface roughness. The utter and absolute failure of Takahashi to even mention such an affirmatively-claimed step means that US ‘446 is non-enabling as prior art against Claims 15 – 19, 21 – 22 and 24. One of ordinary skill in the art is not provided with any disclosure, much less teachings or suggestions, to provide a heated roll with a specific surface roughness. The Applicants ask the question: Where is one of ordinary skill in the art, based on the US ‘446 disclosure, to obtain any guidance concerning surface roughness? The simple answer is that there is no guidance.

As a consequence, the Applicants respectfully submit that the statement in the Official Action that the roll surface roughness, upon other things, is a result effective variable is not demonstrated on the record. This is speculation having no basis on any fact in the record. The prior art simply fails to mention it in any way, much less provide teachings or suggestions to one of ordinary skill in the art that the surface roughness should be in the claimed range or that it would have any effect at all.

This presents the situation that one of ordinary skill in the art could hardly consider the claimed roll surface roughness to be a result effective variable since the prior art has failed to mention that it is a variable of any type, much less a result effective variable. One cannot know to vary a surface roughness if the prior art utterly fails to provide teachings or suggestions to one of ordinary skill in the art to do so or that there is any surface roughness. As a consequence, the Applicants respectfully submit that US '446 is utterly inapplicable to Claims 15 – 19, 21 – 22 and 24. Withdrawal of the rejection is respectfully requested.

The Applicants respectfully request that the above amendments be entered into the Official Record. The amendments are made for the purpose of removing issues from further consideration, no new issues are raised, no new claims are presented and no further searching is required. The changes are simply of an editorial nature. Reconsideration on the merits is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire Application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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